# PREFACE

The following tables compare Ontario Waste Classes and U.S. EPA Land Disposal Ban Categories. There is considerable uncertainty in this undertaking. Depending on their concentrations, characteristics and sources, Ontario waste classes may or may not fall within the EPA land disposal ban categories. The terminology we have used in the fourth column of the table reflects this uncertainty and the lack of information on specific characteristics of the Ontario waste classes.

The terms used are described briefly below, and should be viewed as a continuum of likelihood based on our best judgments concerning the two classification systems. "Likely" indicates that based on the examples provided in the Ministry of Environment's list of waste classes, it is likely that wastes in this class would fall within the indicated EPA land disposal ban. A "?" denotes considerable uncertainty as to whether or not the waste class would be banned. The uncertainty is due to lack of comparability between Ontario waste classes and EPA ban categories, or the heterogenous nature of the Ontario waste class. For these classes, we have indicated under what conditions the waste class is likely to be banned. "Unlikely" is used to indicate wastes which do not appear to fall within the EPA ban categories, as they do not appear to contain EPA listed or characteristic wastes.

Note that EPA has set treatment standards for the first ban category (solvents and dioxins) (see Federal Register, Vol. 51, No. 216, November, 7, 1986, pp. 40572-40654), but has not yet done so for the second or third ban categories (California or scheduled wastes). Wastes treated in accordance with the treatment standards set by EPA under Section 3004(m) of RCRA are not subject to the land disposal prohibition and may be land disposed. We assume that the third ban category (scheduled wastes) are in fact banned according to the present schedule. Also, the table does not account for any EPA small generator exemptions that might apply.

ESRG requested a review of these tables by U.S. EPA's Land Disposal Prohibition Branch. While EPA is not willing to provide official comments, a key member of this branch has reviewed the table and (with the uncertainties indicated) provided unofficial comments as to the reasonableness of the matching. The comparative table and background documents have also been reviewed for reasonableness and accuracy by an environmental chemist from Cambridge Analytical Associates, Inc. of Boston with expertise in hazardous waste. His comments and suggestions are reflected in the updated table.

The updated table differs from the first draft in a number of ways. The format has been altered slightly to clarify the reasons for our ban category designation. Due to additional review and the input from the outside experts mentioned above, many of the classes which previously had a "?" designation in the draft table, are now categorized as "likely." This is true for the following Ontario Waste Classes: 113, 122, 123, 134, 135, 148, 213, 221, 232, 233, 242, 243, 251, 261, 264, 265, 266, 268, 269, 321, and 331. Again, the reasons are indicated in the last column of the table. In addition, class 147 (Chemical Fertilizer Wastes) has been changed from likely to unlikely since there is no mention of such wastes in the EPA listed wastes and they are unlikely to be "characteristic" wastes. Finally, the reasons for the categories indicated have been altered in numerous cases, most often to provide additional information.

## Comparison of Ontario Waste Classes and U.S. EPA Land Disposal Ban Categories

| Ontario MOE Waste Class(1) | | Ontario Characteristics(2) | Land Disposal Ban? | Reason (ban numbering system) |
|---|---|---|---|---|
| **INORGANIC WASTES** | | | | |
| **Acid Solutions** | | | | |
| 111 | Spent pickle liquor | C,H | likely | if pH <2 (2) |
| | | | likely | if pH>2 but corrosive (3) |
| | | | likely | if pH>2 and non-corrosive, but waste is #K062 (3) |
| 112 | Acid solutions, sludges and residues containing heavy metals | C | likely | if pH <2 (2) |
| | | | likely | if Calif. metals are exceeded (2) |
| | | | likely | if pH >2 and Calif. metals not exceeded, but is EP Toxic |
| 113 | Acid solutions, sludges and residues containing metals and non-metals | C,L | likely | if pH <2 (2) |
| | | | likely | if pH >2 but corrosive (3) |
| 114 | Other inorganic acid wastes | C,H | likely | if pH <2 (2) |
| | | | likely | if pH >2 but corrosive (3) |
| **Alkaline Solutions** | | | | |
| 121 | Alkaline Solutions, sludges and residues containing heavy metals | C,H,L | likely | if cadmium or cyanides exceed Calif. limits (2) |
| | | | likely | if pH >12.5 or waste is F007-0012 (3) |
| 122 | Alkaline Solutions, sludges and residues containing other metals and non-metals, not containing cyanides | C,L | likely | if corrosive (3) |
| | | | likely | if waste = K060 (3) |
| 123 | Alkaline phosphates | C | likely | if corrosive (3) |
| **Aqueous Salts** | | | | |
| 131 | Neutralized Solutions, sludges and residues containing heavy metals | C,H,L,T | likely | if Calif. limits are exceeded (2) |
| | | | likely | if corrosive, EP Toxic, or waste = F006 (3) |
| 132 | Neutralized Solutions, sludges and residues containing other metals | L | likely | if corrosive or waste = F019 (3) |
| 133 | Brines, chlor-alkali sludges and residues | L | likely | if Calif. limits for Hg exceeded (2) |
| | | | likely | if waste = K071 or K106 (3) |
| 134 | Waste containing sulphides | L | likely | if reactive or corrosive (3) |
| 135 | Wastes containing other reactive anions | C,H | likely | if ignitable (chlorates) corrosive, or reactive (3) |

| | | | | |
|---|---|---|---|---|
| **Miscellaneous Inorganic Wastes and Mixed Wastes** | | | | |
| 141 | Inorganic wastes from pigment manufacturing | | likely | if Calif. limits for chrome exceeded (3) |
| | | | likely | if waste = K002 - K007 (3) |
| 142 | Primary lead, zinc and copper smelting wastes | | likely | if Calif. limits for lead exceeded (2) |
| | | | likely | if EPA listed (3) |
| 143 | Residues from steel making | H,L,N,T | likely | if Calif. limits for metals exceeded (2) |
| | | | likely | if EPA listed waste = K061 (3) |
| 144 | Liquid tannary waste sludges | T | unlikely | exempt under 40 CFR 261.4(b) |
| 145 | Wastes from the use of paints, pigments and coatings | I | likely | if solvent is F001-F005 and above 2-year variance limits (>1%) (1) unlikely (2) as halogenated solvents not typcally used |
| | | | likely | if ignitable or EPA listed waste = K086 |
| 146 | Other specified inorganic sludges, slurries or solids | C,I,L,N,R,T | likely | if Calif. limits for metals exceeded (2) |
| | | | likely | if corrosive or ignitable or EPA listed (3) (despite certain 146 wastes being reported C or I in gen. reg. data base, this appears unlikely) |
| 147 | Chemical fertilizer wastes | | unlikely | no mention of such wastes (amonia, nitrate, phosphorous wastes) in EPA lists |
| 148 | Miscellaneous waste inorganic chemicals | A,N | likely | if Calif. limits exceeded (2) |
| | | | likely | if EPA listed (3) |
| 149 | Landfill leachate | L | ? | broad, undefined class |
| | | | | if Calif. limits for metals exceeded (unlikely) (2) |
| | | | | if EP Toxic (3) |
| 150 | Inert inorganic wastes | | unlikely | not EPA listed |
| <u>ORGANIC WASTES</u> | | | | |
| **Non-halogenated Spent Solvents** | | | | |
| 211 | Aromatic solvents and residues | H | likely | depending on concentration or constituents (1) or (3) |
| 212 | Aliphatic solvents and residues | B,H,I,L | likely | depending on concentration or constituents (1) or (3) |
| 213 | Petroleum distillates | I | likely | if ignitable (3) |
| **Fuels** | | | | |
| 221 | Light fuels | I | likely | if ignitable (3) |
| 222 | Heavy fuels | L | unlikely | not EPA listed; unlikely ignitable |
| **Resins and Plastics** | | | | |
| 231 | Latex wastes | L | unlikely | not EPA listed; unlikely to contain metals or be characteristic waste |

| | | | | |
|---|---|---|---|---|
| 232 | Polymeric resins | | likely | if halogenated monomers remain in high concentrations (2) |
| | | | likely | if EPA listed (3) |
| 233 | Other polymeric wastes | L | likely | if halogenated monomers remain in high concentrations (2) |
| | | | likely | if EPA listed (3) |
| **Halogenated Organic Wastes** | | | | |
| 241 | Halogenated Solvents and residues | H | likely | if EPA listed F waste and above 1% concentration (1)<br>if Calif. limits exceeded and no 2-year variance (i.e. >1000 ppm and not a dilute wastewater) (2) |
| 242 | Halogenated pesticides and herbicides | | likely | if EP Toxic or EPA listed (3) |
| 243 | Polychlorinated biphenyls (PCB) | | likely | if Calif. limit of 50 ppm in liquid haz. waste, or halogenated organics exceed Calif. limits (2) (also covered under Toxic Substances Control Act) |
| **Oily Wastes** | | | | |
| 251 | Waste oils/sludges (petroleum based) | H,I,L,T | likely | likely EPA listed = K048-K052 or if ignitable (3) |
| 252 | Waste crankcase oils and lubricants | I,L,T | ? | if ignitable (3) (despite certain 252 wastes being reported in gen. reg. data base as ignitable, this appears unlikely); also not EPA listed |
| 253 | Emulsified oils | L,T | unlikely | not EPA listed; unlikely ignitable |
| 254 | Oily water/waste oil from waste transfer/ processing sites | L | ? | if EPA listed 251 wastes (K048-K052) are bulked and blended; otherwise unlikely |
| **Miscellaneous Organic Wastes and Mixed Wastes** | | | | |
| 261 | Pharmaceuticals | | likely | if EPA listed = K048 or K102 (3) |
| 262 | Detergents and soaps | L | unlikely | not EPA listed |
| 263 | Miscellaneous waste organic chemicals | I | ? | broad class<br>if EPA listed or ignitable (or other characteristic waste) (3) |
| 264 | Photoprocessing wastes | C,L,T | likely<br>likely | if Calif. limits exceeded (2)<br>if corrosive or EP Toxic (for silver content) (3) |
| 265 | Graphic arts wastes | | likely<br>likely | if solvent on EPA F list (1)<br>if EPA listed (3) |
| 266 | Phenolic waste streams | H | likely<br>likely | if cresylic acid (1)<br>if EPA listed (3) |
| 267 | Organic acids | C,H | likely | if corrosive or EPA listed (3)<br>(most pH >2 so not on Calif. list) |
| 268 | Amines | L | likely | if EPA listed = U328 or U353 (for toluidine) |

| | | | | |
|---|---|---|---|---|
| 269 | Organic non-halogenated pesticide and herbicide wastes | | likely | if Calif. limits for arsenicals exceeded (2)<br>if EPA listed (3) |
| 270 | Other specified organic sludges, slurries and solids | L,N | likely | depends on concentration and constituents (1) or (2) |
| | **Processed Organic Wastes from Transfer Stations** | | | |
| 281 | Non-halogenated rich organics | | likely<br>likely | if solvent on EPA F list (1)<br>if EPA listed (3) |
| 282 | Non-halogenated lean organics | | likely<br>likely | if solvent on EPA F list (1)<br>if EPA listed (3) |
| | **Plant and Animal Wastes** | | | |
| 311 | Organic tannery wastes | T | unlikely | exempt under 40 CFR 261.4(b) |
| 312 | Pathological wastes | | unlikely | exempt under 40 CFR 261.4(b) |
| | **Explosive Manufacturing Wastes** | | | |
| 321 | Wastes from the manufacture of explosives and detonation products | R | likely | likely EPA listed as K044 - K046 (3) |
| | **Compressed Gases...** | | | |
| 331 | Waste compressed gases, including cylinders | | likely | if ignitable or reactive (3) |

## NOTES

1 See attached "Ontario Ministry of Environment Waste Classes" for examples of each waste class.

2 The identification of waste characteristics is from the Regulation 309 Generator Registration database. The Ontario hazardous waste characteristics are as follows:

A = Acute Hazardous Waste Chemical
B = Hazardous Waste Chemical
C = Corrosive
D = PCB Waste
H = Hazardous Industrial Waste
I = Ignitable
L = Liquid Industrial Waste
N = Registerable Solid Waste
P = Pathological
R = Reactive
S = Severely Toxic
T = Leachate Toxic

Of the above characteristics, C, I, and R appear to correspond closely to Corrosive, Ignitable, and Reactive characteristics as defined in the EPA regulations (10 CFR 261). In some instances, these characteristics were considered in developing the comments in the final column of the table. Other Ontario characteristics do not appear to correlate closely with EPA characteristic definitions.

3 Depending on their concentrations, characteristics and sources, Ontario waste classes may or may not fall within the EPA land disposal ban categories. Here "likely" indicates that based on the examples provided in the Ministry of Environment's list of waste classes, it is likely that wastes in this class would fall within the indicated EPA land disposal ban. A "?" denotes a high level of uncertainty as to whether or not the waste class would be banned. The uncertainty is due to lack of comparability between Ontario waste classes and EPA ban categories, or the heterogenous nature of the Ontario waste class. For these classes, we have indicated under what conditions the waste class is likely to be banned. "Unlikely" is used to indicate wastes which do not appear to fall within the EPA ban categories.

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EPA ban categories and ban effective dates follow:

| Categories | | Date Ban Effective |
|---|---|---|
| (1) | Solvents and Dioxins | 11/8/86 for solvents (except deep well injection 8/8/88)<br>11/8/88 for dioxins (due to two-year national variance) |
| (2) | California List<br><br>Includes liquid hazardous wastes containing 1) free cyanides, 2) specified metals, or 3) PCBs above statutory concentrations; or 4) with pH <= 2; or 5) hazardous wastes halogenated organic compounds above statutory limits. | 7/8/87 (except deep well injection) |
| (3) | Scheduled (EPA Listed) Wastes<br><br>Includes all other (not solvents, dioxins, or California list) EPA listed wastes under RCRA Section 3001. | 8/8/88<br>6/8/89<br>5/8/90 |